

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings.

Listing of Claims:

1. (Currently amended) A cyclonic plasma pyrolysis/vitrification system pyrolyzing and vitrifying waste materials into exhaust gas and slag using a plasma torch, the system comprising:

a main reactor having a waste inlet supplying waste materials,

an exhaust gas outlet for discharging exhaust gas, and

a slag outlet for discharging slag;

a plasma torch inclined at a predetermined angle with respect to the internal bottom surface of the main reactor to induce a cyclonic gas flow which rotates about an essentially horizontal axis above the bottom surface of the main reactor for give a maximum circulating power to the exhaust gas, pyrolyzing and vitrifying the waste materials in the main reactor;

a gas burner arranged with the plasma torch to direct a flame into the main reactor in manner to promote heating of the main reactor;

an auxiliary reactor connected to the exhaust gas outlet of the main reactor, for discharging ~~[[the]] exhaust gas to the outside~~;

a slag discharger connected to the slag outlet of the main reactor, for discharging the slag ~~to the outside~~;

wherein the plasma torch circulates the ~~exhaust~~ gas in the main reactor ~~with a maximum circulating power by strong plasma jet~~, and makes subjects flyashes contained in the circulating exhaust gas to be to centrifugal force, melted causing the flyash to melt after being and to be absorbed into melted materials of molten waste materials [[in]] on both inner walls and the bottom surface of the main reactor by a centrifugal force.

2. (Original) The cyclonic plasma pyrolysis/vitrification system of claim 1 wherein the slag discharger is formed just under the plasma torch.

3. (Currently amended) The cyclonic plasma pyrolysis/vitrification system of claim 1, including the waste inlet located in a side wall of the main reactor and located to deliver waste material essentially horizontally into the cyclonic gas flow, and wherein the exhaust gas outlet having opens into the main reactor a designated distance ~~therebetween~~ from the waste inlet in the main reactor, and further including ~~wherein the main reactor has~~ a downwardly extending separator wall with a of designated length formed ~~therebetween~~ therein.
4. (Currently amended) The cyclonic plasma pyrolysis/vitrification system of claim 1, wherein the exhaust gas outlet is disposed so as to correspond essentially with the axis of the cyclonic gas flow and in the center of the circulating exhaust gas, namely, in the essentially a center of an inner wall of the main reactor.
5. (Original) The cyclonic plasma pyrolysis/vitrification system of claim 1, wherein the plasma torch is inclined at the angle ranging from 20 to 40 degrees with respect to the bottom surface of the main reactor.
6. (New) The cyclonic plasma pyrolysis/vitrification system of claim 1, further comprising an auxiliary chamber into which exhaust gas from the exhaust gas outlet is introduced; and
another gas burner disposed with the auxiliary chamber to circulate and heat the exhaust gas in the auxiliary chamber.
7. (New) The cyclonic plasma pyrolysis/vitrification system of claim 3, wherein the downwardly extending separator wall is located between the cyclonic gas flow and the exhaust gas outlet.
8. (New) The cyclonic plasma pyrolysis/vitrification system of claim 7, wherein the exhaust gas outlet is formed in a ceiling of the main reactor.